Barriers for AI Development

Sana Ben Jemaa

Orange Labs Chatillon, France

LF AI

September 16, 2019

orange™

Orange Expert
Future
networks
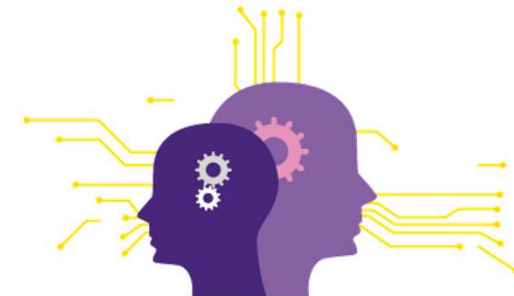
AI for Radio Access Networks
Test and learn internally and with our partners

Mid-term activity:
- **Trials with RAN suppliers and with start-ups**
- **Development of AI RAN management features in-house**
- **Collaboration with operational teams in Orange affiliate**

Research activity: internal research, collaborative projects and partnerships
- **How to learn online efficiently?**
- **How to predict accurately (both in time and space)?**
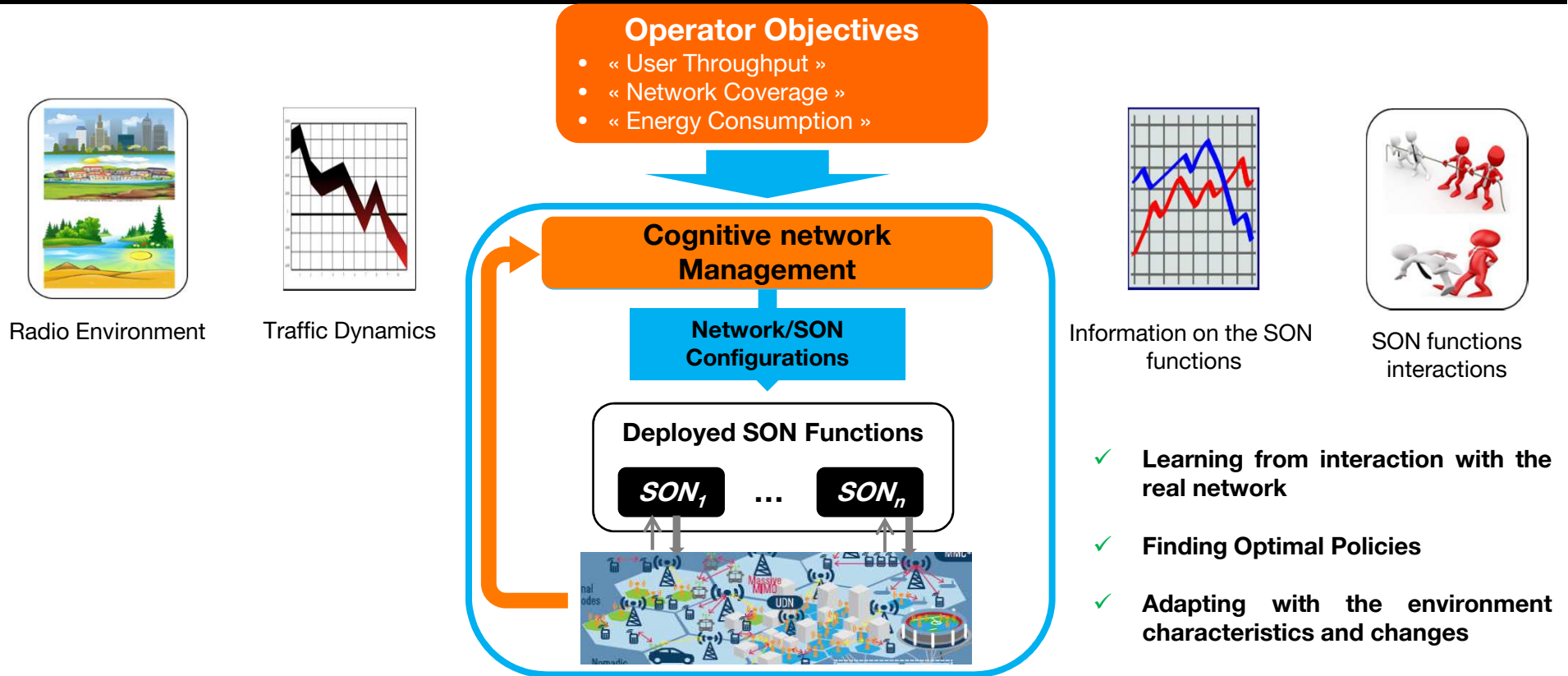- **How to build a RAN which is AI capable by design ?**

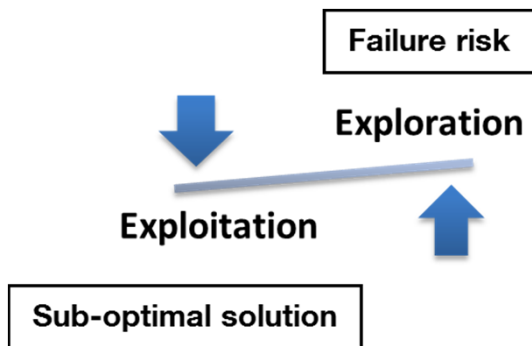

Knowledge Building

Decision support

Online Decision

Cognitive RAN management use case

Operator Objectives
- « User Throughput »
- « Network Coverage »
- « Energy Consumption »

Radio Environment

Traffic Dynamics

Cognitive network Management

Network/SON Configurations

Deployed SON Functions

SON_1 ... SON_n

Information on the SON functions

SON functions interactions

✓ **Learning from interaction with the real network**

✓ **Finding Optimal Policies**

✓ **Adapting with the environment characteristics and changes**

3

Cognitive RAN management use case
Towards an operational implementation

Failure risk

Exploration

Exploitation

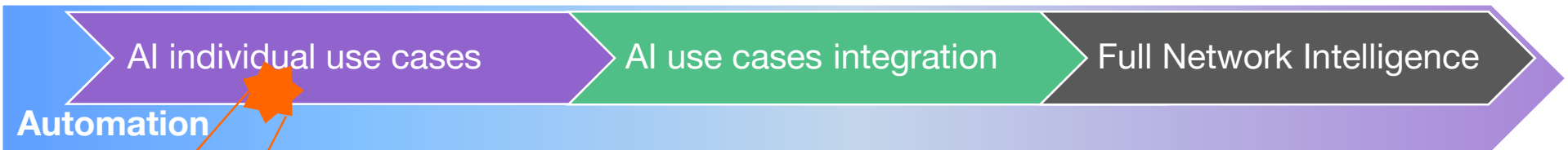Sub-optimal solution

- ✓ **Pre-training: using simulations, historic data and human expertise to avoid building strategies from scratch**

- ✓ **Collaborative learning and Knowledge transfer to speed the convergence and limit exploration**

- ✓ **Control performance degradation and ability to rollback**

Tight collaboration between radio engineers and AI scientists is crucial

4

Barriers for AI development

AI individual use cases → AI use cases integration → Full Network Intelligence
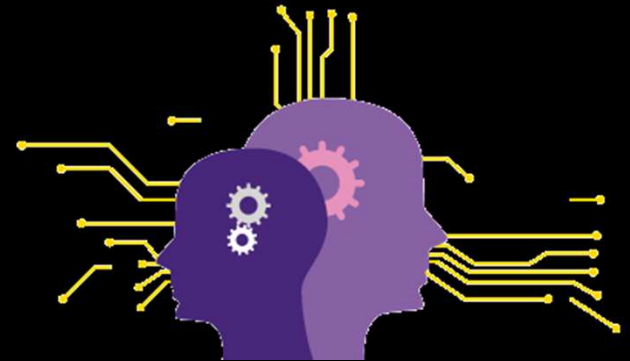
Automation

Availability and Quality of data

Skills: multi-disciplinary teams including network engineers and AI scentists

Trust and adoption: technical maturity and cultural change

Thank you!

contact:sana.benjemaa@orange.com